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CORA FEDORNOCK
BERKELEY LAW & TECHNOLOGY GROUP
1758 - 114th AVENUE SE
SUITE 110
BELLUVUE, WA 98004

EXAMINER	
KIM, DAVID S	

ART UNIT	PAPER NUMBER
2633	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/728,373	Applicant(s) YEE ET AL.	
	Examiner David S. Kim	Art Unit 2633	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 August 2005*.

2a)☒ This action is FINAL. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed on 10 April 2001 (Paper No. 4) fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but all the information referred to therein has not been considered. Examiner considered the information documents that were readily accessible, such as patents and journal documents that are available through online access. The other documents have not been considered; these documents are indicated by a lack of Examiner's initials next to the document listings. Should Applicant desire the consideration of these documents by Examiner, Applicant is advised to send a legible copy of each of these documents to the Office.

Drawings

2. Applicant's compliance with the objections to the drawings in a previous Office Action (mailed 22 March 2004) is noted and appreciated. The replacement drawing sheets were received on 24 August 2004. These replacement drawing sheets are approved. Accordingly, in view of the informal appearance of the drawings, a corresponding set of formal drawings is requested.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in

order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. **Claims 1-9, 12, 15, 18-24, and 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe (U.S. Patent No. 5,896,211) in view of Tsushima et al. (U.S. Patent No. 5,140,453, hereinafter "Tsushima") and Jacobsen et al. ("The effect of crosstalk and phase noise in multichannel coherent optical ASK systems", hereinafter "Jacobsen").

Regarding claim 1, Watanabe discloses:

An optical communication system for communicating information comprising:

a receiver subsystem (Fig. 16) comprising:

an optical splitter (121) for splitting a composite optical signal having at least two subbands of information and at least one tone into at least two optical signals; and

at least two heterodyne receivers (portion of Fig. 16 after 121), each heterodyne receiver coupled to receive one of the optical signals from the optical splitter for recovering information from one of the subbands contained in the optical signal, each heterodyne receiver comprising:

a heterodyne detector (122-1...122-k) for mixing an optical local oscillator signal with the optical signal to produce an electrical signal which includes a frequency down-shifted version of the subband and the tone of the optical signal; and

a signal extractor (37-1...37-k) coupled to the heterodyne detector to produce a frequency component containing the information.

Watanabe does not expressly disclose:

said signal extractor coupled to the heterodyne detector *for mixing the frequency down-shifted subband with the frequency down-shifted tone* to produce a frequency component containing the information;

wherein a signal extractor of one of the at least two heterodyne receivers comprises a bandpass filter, a square law device, and a low pass filter and is configured to square an optical signal containing a tone and a sideband, and wherein

> <u>a signal extractor of another of the at least two heterodyne receivers comprises two extraction paths and a combiner, each extraction path configured to process a sideband within an electrical signal.</u>

However, this mixing is a common demodulation technique used in coherent detection systems to extract an information signal from heterodyne-detected signals. Tsushima teaches such mixing as part of a heterodyne detection device (e.g., note the squaring circuits in the demodulator of Fig. 4 as part of the device in Fig. 1). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the heterodyne detection device of Tsushima in the system of Watanabe. One of ordinary skill in the art would have been motivated to do this since Tsushima directly addresses some concerns of Watanabe. That is, Watanabe teaches the need for addressing polarization fluctuation, an adverse effect in optical heterodyne reception (col. 13, l. 40-47). As a countermeasure, Watanabe lists several methods (col. 13, l. 49-51). One of the listed methods is a polarization diversity receiving method (col. 13, l. 49-50). Watanabe notes that this method is promising, but ceases further discussion about it due to costs stemming from a dual configuration (col. 13, l. 54-56). Tsushima also recognizes the advantages of this method (col. 1, l. 17-30) and the costs of a dual configuration (col. 2, l. 7-26). Nonetheless, Tsushima employs this promising polarization diversity receiving method in a way that mitigates the dual configuration and cost concerns (col. 10, l. 3-26). Thus, Tsushima addresses the concerns of Watanabe regarding the polarization diversity receiving method, enabling one of ordinary skill in the art to take advantage of the benefits of this polarization diversity receiving method, such as high sensitivity (col. 1, l. 15) and an improved signal-to-noise ratio (col. 1, l. 25-30).

<u>Accordingly, Watanabe in view of Tsushima discloses:</u>

> <u>wherein a signal extractor of one of the at least two heterodyne receivers comprises two extraction paths (Tsushima, e.g., Fig. 4, two paths) and a combiner (Tsushima, e.g., adder 19), each extraction path configured to process a sideband (Tsushima, e.g., each path processes one of signals 5a and 5b in Fig. 3C, each signal including a sideband) within an electrical signal.</u>

Still, Watanabe in view of Tsushima does not expressly disclose:

said signal extractor coupled to the heterodyne detector *for mixing the frequency down-shifted subband with the frequency down-shifted tone* to produce a frequency component containing the information;

wherein a signal extractor of *another* of the at least two heterodyne receivers comprises a bandpass filter (except Watanabe does disclose bandpass filters 36-1...36-k), a square law device, and a low pass filter and is configured to square an optical signal containing a tone and a sideband.

However, this mixing is a common demodulation technique used in coherent detection systems to extract an information signal from heterodyne-detected signals. Jacobsen teaches such mixing as part of a heterodyne detection device that does comprise a bandpass filter (IF filter in Fig. 1), a square law device (note the squaring circuit in the demodulator of Fig. 1 that mixes), and a lowpass filter (LPF in Fig. 1) and that is configured to square an optical signal containing a tone (ASK optical signals include a carrier tone) and a sideband (ASK optical signals include at least one sideband). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the heterodyne detection device of Jacobsen in the system of Watanabe. One of ordinary skill in the art would have been motivated to do this since Watanabe is relatively silent about the technical details of its signal extractors (Watanabe, 37-1...37-k in Fig. 16), and the teachings of Jacobsen suitably speaks into this silence by providing a detailed structure of a heterodyne detection device that is applicable to optical signals in Watanabe. In particular, notice that Watanabe teaches the use of multichannel ASK optical signals (Watanabe, ASK on the left side of Fig. 16), and the heterodyne detection device of Jacobsen receives multichannel ASK optical signals (Jacobsen, p. 1006, col. 2, 3rd paragraph).

Regarding claim 2, 4-5, and 8 Watanabe in view of Tsushima and Jacobsen does not expressly disclose:

The optical communications system of claim 1 wherein the optical splitter includes a separate splitter for separating each optical signal from the composite signal (claim 2), or

The optical communications system of claim 1 wherein the optical splitter includes a wavelength division demultiplexer for wavelength division demultiplexing the composite optical signal into the optical signals (claim 4), or

The optical communications system of claim 1 wherein the optical splitter includes a wavelength-selective optical power splitter for splitting the composite optical signal into optical signals, each optical signal including a different primary subband and attenuated other subbands, or

The optical communications system of claim 1 further comprising:

an optical wavelength filter coupled between the optical splitter and one of the heterodyne receivers.

However, these splitter limitations are all common and well known in the art, and both perform the same function of isolating a desired optical signal from a composite signal. Also, Watanabe in view of Tsushima <u>and Jacobsen</u> teaches an apparatus (optical branch unit and filters in Fig. 12) that performs the same general function. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement this isolating function according to the splitter limitations of claims 2, 4, 5, or 8. One of ordinary skill in the art would have been motivated to do this since they offer common, additional options for implementing the same function, thus providing design and manufacturing flexibility. Moreover, these rejections are made in view of the recognition that these limitations do not constitute the thrust of the inventive concepts of Applicant's invention. Rather, they comprise common expedients of a well-known technical function in the art.

Regarding claim 3, Watanabe in view of Tsushima <u>and Jacobsen</u> discloses:

The optical communications system of claim 1 wherein the optical splitter includes an optical power splitter (121 in Fig. 16) for splitting the composite optical signal into optical signals which are substantially the same in spectral shape (optical splitters conventionally split the input signal into multiple copies of the input signal, each copy having a reduced power level).

Regarding claim 6, Watanabe in view of Tsushima <u>and Jacobsen</u> discloses:

The optical communications system of claim 1 wherein:

the electrical signal further comprises direct detection components (not shown but these components result from the mixing of the heterodyne detector in Fig. 1 of Tsushima).

Watanabe in view of Tsushima and Jacobsen does not expressly disclose:

the frequency down-shifted version of the subband does not spectrally overlap with the direct detection components.

However, note that the frequency down-shifted version of the subband is filtered by a bandpass filter (Tsushima, bandpass filters in, e.g., Figs. 1 and 4). Also, note that the direct detection components that result from the mixing of the heterodyne detector in Fig. 1 of Tsushima are generally unwanted components in standard heterodyne detection schemes. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to arrange the placement of the frequency down-shifter version of the subband so that it does not spectrally overlap with the direct detection components. One of ordinary skill in the art would have been motivated to do this to avoid letting these undesired direct detection components pass through the bandpass filters along with a desired subband; these undesired direct detection components can introduce to detrimental interference and noise in the signal extractors (Watanabe, demodulators 37-1...37-k; Tsushima, e.g., Fig. 4).

Regarding claim 7, Watanabe in view of Tsushima and Jacobsen discloses:

The optical communications system of claim 1 wherein the heterodyne detector comprises:

an optical combiner (Tsushima, optical combiner in Fig. 1) for combining the optical local oscillator signal and the optical signal; and

a square law detector (Tsushima, PIN photodiode 14 in Fig. 1, col. 5, lines 13-17; note that a PIN photodiode is a square law detector) disposed to receive the combined optical local oscillator signal and optical signal.

Regarding claim 9, Watanabe in view of Tsushima and Jacobsen discloses:

The optical communications system of claim 1 wherein the tone for each optical signal is located at an optical carrier frequency for the corresponding subband (note the tones in the middle of each subband in Fig. 7C).

Regarding claim 12, Watanabe in view of Tsushima and Jacobsen discloses:

The optical communications system of claim 1 wherein the frequency component includes a difference component (Tsushima, Fig. 3C, col. 6, lines 3-26).

Regarding claim 15, Watanabe in view of Tsushima and Jacobsen discloses:

The optical communications system of claim 1 further comprising:

a transmitter subsystem (transmitter side in Fig. 16) for generating the composite optical signal.

Regarding claims 18-24, claims 18, 19, 20, 21, 22, 23, and 24 are method claims that correspond to system claims 1, 2, 3, 4, 5, 7, and 9, respectively. Therefore, the recited means in system claims 1-5, 7, and 9 read on the corresponding steps in method claims 18-24.

Regarding claim 28, Watanabe in view of Tsushima and Jacobsen discloses:

The method of claim 18 further comprising:

encoding (data signals D1...Dk in Fig. 16) the information in a composite optical signal (output from optical modulator 33 in Fig. 16); and

transmitting (modulator 33 and fiber 34 in Fig. 16) the composite optical signal across an optical fiber.

6. **Claims 10-11 and 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe in view of Tsushima and Jacobsen as applied to claims 1 and 18 above, and further in view of Hill et al. (U.S. Patent No. 5,546,190, hereinafter "Hill").

Regarding claim 10, Watanabe in view of Tsushima and Jacobsen does not expressly disclose:

The optical communications system of claim 1 wherein the tone for each optical signal includes a pilot tone located at a frequency other than at an optical carrier frequency for the corresponding subband.

Hill teaches such a pilot tone (Figs. 2-5; col. 2, line 62 – col. 3, line 33; col. 4, lines 12-53; col. 5, lines 21-28; col. 5, line 59 – col. 6, line 11). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the pilot tone of Hill in the system of Watanabe in view of Tsushima and Jacobsen. One of ordinary skill in the art would have been motivated to do

this to add the following features: simultaneously generate subcarrier frequencies for demodulation, the clock signal, and an automatic frequency control signal for the local oscillator (Hill, col. 3, lines 28-32).

Regarding claim 11, Watanabe in view of Tsushima, Jacobsen, and Hill discloses:

The optical communications system of claim 1 wherein at least two optical signals (Hill, note the multiple signals with the same pilot tone in Fig. 4) have tones at the same frequency.

Regarding claim 25, claim 25 is a method claim that corresponds to system claim 10. Therefore, the recited means in system claim 10 read on the corresponding steps in method claim 25.

7. **Claims 13-14, 16-17, 26-27, and 29-30** are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe in view of Tsushima and Jacobsen as applied to claims 1, 15, 18, and 28 above, and further in view of Wong (U.S. Patent No. 6,058,227).

Regarding claim 13, Watanabe in view of Tsushima and Jacobsen does not expressly disclose:

The optical communications system of claim 1 wherein the receiver subsystem further comprises:

at least two FDM demultiplexers, each FDM demultiplexer coupled to receive the frequency component from one of the heterodyne receivers for FDM demultiplexing the frequency component into a plurality of electrical low-speed channels.

Wong discloses a transmission method that combines the principles of FDM and WDM (Wong, Fig. 3). This method includes FDM demultiplexers (Wong, power divider 77 and filters in RF Tuners 78 perform FDM demultiplexing). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the system of Watanabe in view of Tsushima and Jacobsen to incorporate the combination of FDM and WDM, as taught in Wong. One of ordinary skill in the art would have been motivated to do this to increase the data transmission rates across a transmissions link and to expand the system. That is, the system of Watanabe in view of Tsushima and Jacobsen employs FDM. In view of Wong, this system could multiply data transmissions rates by transmitting on additional wavelengths, thus expanding the system (Wong, abstract, col. 4, lines 17-24).

Regarding claim 14, Watanabe in view of Tsushima, Jacobsen, and Wong discloses:

The optical communications system of claim 13 wherein the receiver subsystem further comprises:

at least two QAM demodulation stages (Wong, Fig. 5), each QAM demodulation stage coupled to one of the FDM demultiplexers for QAM demodulating the electrical low-speed channels.

Regarding claim 16, Watanabe in view of Tsushima and Jacobsen does not expressly disclose:

The optical communication's system of claim 15 wherein the transmitter subsystem comprises:

at least two transmitters, each for generating one of the optical signals, each transmitter using a different optical carrier frequency; and

an optical combiner coupled to the transmitters for optically combining the optical signals into the composite optical signal.

Wong discloses a transmission method that combines the principles of FDM and WDM (Wong, Fig. 3). This method includes multiple transmitters (Wong, Figs. 1-2), each for generating one of the optical signals, with different optical carrier frequencies and an optical combiner (Wong, WDM 24 in Fig. 1) coupled to the transmitters for optically combining the optical signals into the composite optical signal. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the system of Watanabe in view of Tsushima and Jacobsen to incorporate the combination of FDM and WDM, as taught in Wong. One of ordinary skill in the art would have been motivated to do this to increase the data transmission rates across a transmissions link and to expand the system. That is, the system of Watanabe in view of Tsushima and Jacobsen employs FDM. In view of Wong, this system could multiply data transmissions rates by transmitting on additional wavelengths, thus expanding the system (Wong, abstract, col. 4, lines 17-24).

Regarding claim 17, Watanabe in view of Tsushima, Jacobsen, and Wong discloses:

The optical communications system of claim 15 wherein the transmitter subsystem comprises:

at least two electrical transmitters (Watanabe, electrical transmitters inputting signals to multiplexer 71 in Fig. 16; Wong, transmitter subsystems 80 in Fig. 3) for generating electrical channels;

an FDM multiplexer (Watanabe, multiplexer 71 in Fig. 16; Wong, FDM in Fig. 3) coupled to the electrical transmitters for FDM multiplexing the electrical channels into an electrical high-speed channel, the electrical high-speed channel further including the tones (Watanabe, subcarriers in Fig. 7C; Wong, carriers in the transmitter side in Fig. 3); and

an E/O converter (Watanabe, optical modulator 33 in Fig. 16; Wong, E/O converter in Fig. 3) coupled to the FDM multiplexer for converting the electrical high-speed channel into the composite optical signal.

Regarding claims 26-27 and 29-30, claims 26, 27, 29, and 30 are method claims that correspond to system claims 13, 14, 16, and 17, respectively. Therefore, the recited means in system claims 13-14 and 16-17 read on the corresponding steps in method claims 26-27 and 29-30.

8. **Claim 31** is rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe in view of Tsushima and Jacobsen as applied to claim 28 above, and further in view of Ellis et al. ("Feedback control of a linearised Mach-Zehnder modulator for SCM applications", hereinafter "Ellis") and Sargis et al. (U.S. Patent No. 5,596,436, hereinafter "Sargis").

Regarding claim 31, Watanabe in view of Tsushima and Jacobsen discloses:

The method of claim 28 wherein the step of encoding the information in a composite optical signal comprises:

receiving an optical carrier.

Watanabe in view of Tsushima and Jacobsen does not expressly disclose:

modulating the optical carrier with the information using a raised cosine modulation biased at a point substantially around a V_π point.

However, this modulating is well known in the art for Mach-Zehnder modulators. Watanabe does not expressly teach using a Mach-Zehnder modulator. Rather, Watanabe teaches direct modulation using a DFB laser to modulate an optical carrier (col. 4, l. 17-21). On the other hand, Ellis

teaches external modulation using a Mach-Zehnder modulator instead of direct modulation using a DFB laser (p. 33, middle of the paragraph under section I). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to employ external modulation using a Mach-Zehnder modulator instead of the direct modulation using the DFB laser of Watanabe in view of Tsushima and Jacobsen. One of ordinary skill in the art would have been motivated to do this since external modulation using a Mach-Zehnder modulator provides advantages over direct modulation using a DFB laser, such as the lack of the nonlinear distortion caused by a frequency "chirp" that is generated by a directly modulated DFB laser (p. 33, middle of the paragraph under section I).

Employing a Mach-Zehnder modulator, one of ordinary skill in the art would inherently operate it using some Mach-Zehnder bias point (note the transfer function in Applicant's Fig. 4). The two most common bias points are around a quadrature point and a V_π point. Sargis discloses the use of a Mach-Zehnder modulator biased around a V_π point (null bias point in col. 3, l. 40-46). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modulate the optical carrier of Watanabe in view of Tsushima, Jacobsen, and Ellis with the information using a raised cosine modulation biased at a point substantially around a V_π point, as taught in Sargis. One of ordinary skill in the art would have been motivated to do this to suppress the optical carrier (col. 3, l. 40-46), thereby preventing the optical carrier from dominating the transmission signal (in comparison with the smaller subcarriers/subbands) and leading to crosstalk at the receiving end (col. 3, l. 49-51).

Response to Arguments

9. Applicant's arguments with respect to the newly amended claims have been considered but are moot in view of the new ground(s) of rejection. Applicant's arguments (filed on 09 August 2005, p. 8-9) are based on new limitations introduced by amendment to independent claims 1 and 18. In particular, these new limitations provide further details about two kinds of signal extractors. However, Tsushima already discloses one of these two kinds of signal extractors. Jacobsen is newly applied to address the other of these two kinds of signal extractors.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Corvaja et al. (Fig. 1), Fan et al. (Fig. 2), Foschini et al. (Figs. 1-3), Garrett et al. (Fig. 1), and Tonguz et al. (Fig. 1) are cited to show related signal extractors.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 571-272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DSK

M. R. Sedighian
M. R. SEDIGHIAN
PRIMARY EXAMINER